

Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

Title V/Synthetic Minor draft permit, No. V-05-022

WKEC-Reid/Henderson Station

Henderson, Kentucky 42419-1518

February 15, 2005

Herbert Campbell, Reviewer

Source I.D. # 21-233-00001

Source A.I. # 4196

Activity I.D. # APE20040001

SOURCE DESCRIPTION:

An application for a renewal of the Title V Permit, V-99-066, for the Western Kentucky Energy Corporation/Reid-Henderson Generating Station was received on August 20, 2004. A nitrogen oxides (NO_x) budget permit application was received on June 16, 2003. The new Title V permit will include a renewal of the Phase II Acid Rain Permit and the NO_x Budget Permit.

The source is an electric power generating station consisting of three (3) pulverized coal-fired boilers. The boiler E. Unit 01 has an input capacity of 834 mmBtu/hr and the boilers, E. Unit 02 and E. Unit 03 each have an input capacity of 1568 mmBtu/hr. Each of the three units are wall-fired, and equipped with an electrostatic precipitator (ESP). E. Unit 02 and E. Unit 03 have flue gas desulfurization (FGD), and are equipped with low nitrogen oxide burners and selective catalytic reduction (SCR) technology. In addition, ash, coal and limestone related equipments are utilized.

The facility is classified as a Title V major source of air pollution based on the potential to emit more than 100 tons per year (tpy) of particulate matter less than 10 microns (PM₁₀), carbon monoxide (CO), nitrogen oxides (NO_x), and sulfur dioxide (SO₂). Also, the source is a Synthetic Minor for petcoke usage; and in order to preclude applicability of 401 KAR 51:017 Prevention of significant deterioration of air quality (PSD), emissions of sulfur dioxide shall not exceed 20,846 tons during any consecutive twelve month period in which any amount of petroleum coke is burned.

The processes that are new or different from the most recent source-wide Title V renewal permit application include:

1. Installation of a selective catalytic reduction (SCR) NO_x control device (2004).

The following is a list of significant emission units.

E. Unit 01: Dry-bottom, wall-fired, pulverized coal-fired unit equipped with electrostatic precipitator constructed on or before 1963. Secondary fuel is petroleum coke.

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- E. Unit 02: Dry-bottom, wall-fired, pulverized coal-fired unit equipped with electrostatic precipitator, SO₂ scrubber (wet lime) and SCR. Unit constructed on or before 1970. Secondary fuel is petroleum coke.
- E. Unit 03: Dry-bottom, wall-fired, pulverized coal-fired unit equipped with electrostatic precipitator, SO₂ scrubber (wet lime) and SCR. Unit constructed on or before 1970. Secondary fuel is petroleum coke.
- E. Unit 04: Coal conveying and handling operations include receiving hopper, barge unloading, feeders, magnetic separator, conveyors, secondary crusher, coal stockpiles, and haul roads constructed on or before 1963.
- E. Unit 05: Two cooling towers constructed on or before 1970.
- E. Unit 06: Natural-gas/Number two fuel-oil burning combustion turbine constructed on or before 1970.

REGULATION APPLICABILITY:

- E. Unit 01: Coal-Fired Indirect Heat Exchanger, 834 mmBtu/hr
- E. Unit 02: Coal-Fired Indirect Heat Exchanger, 1568 mmBtu/hr
- E. Unit 03: Coal-Fired Indirect Heat Exchanger, 1568 mmBtu/hr

The E. Unit 01 unit is a Riley Stocker Corporation coal-fired boiler and was installed after 1963. The unit has a maximum fuel input capacity of 876 million British thermal units per hour (mmBtu/hr).

The E. Unit 02 and E. Unit 03 units are Riley Stocker Corporation coal-fired boilers and were installed after 1970. Each unit has a maximum fuel input capacity of 1646 million British thermal units per hour (mmBtu/hr). The primary fuel burned for each unit is coal, and the secondary fuel is pet coke.

The following regulations are applicable to the units:

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| 401 KAR 52:060 | Acid rain permits; |
| 401 KAR 51:160 | NO _x requirements for large utility and industrial boilers; |
| 401 KAR 61:015 | Existing indirect heat exchangers applicable to an emission unit with a capacity of more than 250 mmBtu per hour and commenced before August 17, 1971. |
| Regulation No. 7 | Prevention and control of emissions of particulate matter from combustion of fuel in indirect heat exchangers. |

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40 CFR, Part 64 Compliance Assurance Monitoring (SO₂ & PM/Opacity)

- E. Unit 01 has 942 Phase II allowance allocations set by 40 CFR Part 73.
- E. Unit 02 has 5756 Phase II allowance allocations set by 40 CFR Part 73.
- E. Unit 03 has 5934 Phase II allowance allocations set by 40 CFR Part 73.

401 KAR 52:060, Acid rain permits, applies to E. Unit 01, E. Unit 02, and E. Unit 03 for the prevention, abatement, and control of air pollution and incorporates by reference the federal acid rain provisions as codified in 40 CFR Parts 72 to 78. The NO_x limit and the averaging plans are set by 40 CFR 75 and 76. The units do have SO₂ allowances as listed in 40 CFR, Part 73.10 for each year from 2000 to year 2009.

401 KAR 51:160, NO_x requirements for large utility and industrial boilers, and 40 CFR 97, Subpart C, apply to E. Unit 01, E. Unit 02, and E. Unit 03. The NO_x Budget Permit application for these units was submitted to the Division, and received on June 16, 2003. Requirements contained in that application are incorporated into and made part of the NO_x Budget Permit. Pursuant to 401 KAR 52:020, Section 3, the source shall operate in compliance with those requirements.

Pursuant to 401 KAR 61:015, Section 4(4), and Regulation No. 7, particulate emissions shall not exceed 0.28 lb/mmBtu based on a three-hour average for E. Unit 01, and 0.21 lb/mmBtu based on a three-hour average for E. Unit 02 and E. Unit 03. The permittee may assure continuing compliance with the particulate emission standard by operating the affected facility and associated control equipment such that the opacity does not exceed the upper limit of the indicator value developed from COM data collected during stack tests. If five (5) percent of COM data (based on a three-hour rolling average) recorded in a calendar quarter show excursions from the indicator range, the permittee shall contact the Division within thirty (30) days after the end of the quarter to schedule a stack test to demonstrate compliance with the particulate standard while operating at the conditions which resulted in the excursions. The Division may waive this testing requirement upon a demonstration that the cause of the excursions has been corrected, or may require stack tests at any time pursuant to 401 KAR 50:045, Performance tests. For E Unit 03, the permittee may demonstrate continuing compliance with the particulate standard directly by utilizing a PM CEM in lieu of developing an indicator value.

Pursuant to 401 KAR 61:015, Section 4(4), and Regulation No. 7, emissions shall not exceed 40 percent opacity based on a six-minute average except that a maximum of 60 percent opacity is allowed for a period or aggregate of periods not more than six minutes in any sixty minutes during building a new fire, cleaning the firebox, or blowing soot. Per 40 CFR, Part 64, compliance for the opacity limit will be demonstrated by continuous emission monitoring (COM). For E Unit 03, the COM will be used to demonstrate proper operation of the ESP. Method 9 will be used to demonstrate compliance with the opacity limit.

Pursuant to 401 KAR 61:015, Section 5(1), sulfur dioxide emission shall not exceed 5.2 lbs/mmBtu based on a twenty-four-hour average. Compliance for the sulfur dioxide (SO₂) limit will be demonstrated by continuous emission monitoring (CEMS).

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In order to preclude applicability of 401 KAR 51:017, Prevention of significant deterioration of air quality, total emissions of sulfur dioxide from Emissions Units 01 and 02 at the R. D. Green Station and Emissions Units 01, 02 and 03 at the Reid/Henderson Station shall not exceed 20,846 tons tons during any consecutive twelve (12) month period in which any amount of petroleum coke is burned.

EPA Reference Method 9 shall be performed whenever EPA Reference Method 5 testing is performed. All results shall be documented. In addition, COM data shall also be documented during the same testing time interval. Thus, the permittee may assure compliance with the opacity standards for the Emissions Units 01, 02 and 03 using data collected by COM in lieu of Reference Method 9. For Emissions Unit 03, compliance with the opacity limit will be through Reference Method 9 if the PM CEM is utilized.

EPA Reference Method 5 or equivalent test shall be performed within 1 year from the issuance of this permit to determine the amount of PM emissions per ton of coal processed. The heating value of coal used during the test shall be specifically tested and documented. The opacity shall be recorded from the COM and from Reference Method 9 readings during the stack tests and reported with the test results. The amount of coal combusted (tons), the heating value of coal from a coal analysis (mmBtu/ton), and the calculated emission factor (lbs of PT/mmBtu) shall be documented and reported with the test results. If no additional stack tests are performed, excluded the test performed within 1 year from issue of this permit, the permittee shall conduct one performance test for particulate emissions by the start of the fourth year of this permit to demonstrate compliance with the allowable standard.

E. Unit 04: Coal Handling Operations

E. Unit 05: Cooling Towers

The following regulations are applicable to the units:

401 KAR 63:010 Fugitive Emissions

Pursuant to 401 KAR 63:010 Section 3, no person shall cause or permit the discharge of visible fugitive dust emissions beyond the lot line of the property on which the emissions originate. In addition, reasonable precautions shall be taken to prevent particulate matter from becoming airborne. The materials processed at each unit listed above shall be controlled with wet suppression and/or enclosures so as to comply with the standards specified in Section 3 of 401 KAR 63:010, Fugitive emissions. Compliance is demonstrated when daily observations indicate no visible fugitive dust emissions extend beyond the property line and that the processes and controls are operating normally. Observations and records, if applicable, shall be utilized to document failure to comply.

The permittee shall monitor the amount of coal received and processed through each piece of conveying or handling equipment, including stockpiles, on a weekly basis. Visible emissions from each piece of equipment or operation described for this item or group shall be monitored daily

during daylight hours to determine whether conditions appear to be normal or abnormal. If the emissions appear to be abnormal, the permittee must then comply with the deviation reporting.

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The permittee shall maintain records of the amount of coal received and processed through each piece of conveying or handling equipment, including stockpiles, on a weekly basis. Fugitive emissions are considered to be in compliance when using control measures required by the regulation.

Regulations not applicable to E. Unit 05: (cooling towers), due to applicability date:

401 KAR 63:002, which incorporates by reference the federal regulation 40 CFR 63, Subpart Q, National emission standards for hazardous air pollutants for industrial process cooling towers.

E. Unit 06: Combustion Turbine (Emergency Peaking Unit)

Regulation not applicable to Emission Unit 06 due to applicability date and size:

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, for emissions unit with a heat input at peak load equal to or greater than 10 mmBtu/hour for which construction commenced after October 3, 1977.

OPERATIONAL FLEXIBILITY: N/A

EMISSION AND OPERATING CAPS DESCRIPTION:

In order to preclude applicability of 401 KAR 51:017, Prevention of significant deterioration of air quality, total emissions of sulfur dioxide from Emissions Units 01 and 02 at the R. D. Green Station and Emissions Units 01, 02 and 03 at the Reid/Henderson Station shall not exceed 20,846 tons tons during any consecutive twelve (12) month period in which any amount of petroleum coke is burned.

COMMENTS:

- On August 30, 1999, the Division for Air Quality received a formal objection from the U.S. EPA - Region IV regarding the issuance of the Title V permit for the WKE - Reid/Henderson Station. Specifically, EPA concluded that the burning of petroleum coke, as proposed, is considered a modification pursuant to the prevention of significant deterioration (PSD) rules. The Division for Air Quality has determined that the WKE - R.D. Green Station and the WKE - Reid/Henderson Station are one source as defined by 401 KAR 52:020, Permits, and 401 KAR 51:017, Prevention of significant deterioration of air quality. Therefore, as stated in the Permit # V-99-066, in order to preclude the applicability of 401 KAR 51:017, the total sulfur dioxide emissions from emissions units 1 and 2 at R.D. Green Station and emissions units 1, 2, and 3 at Reid/Henderson Station have been limited to not exceed 20,846 tons during any consecutive twelve month period when any amount of petroleum coke is burned.
- The permittee may assure compliance with sulfur dioxide allowable standard for emissions

unit 1, 2, and 3 by using continuous emission monitoring data.

- The permittee may assure compliance with the opacity standards for this emissions unit using data collected by COM in lieu to Reference Method 9.

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- The permittee will be required to conduct at least two particulate performance test for emissions units 1, 2 and 3 to demonstrate compliance with allowable standards within the term of this permit. The permittee may assure continuing compliance with the particulate standard using COM data as an indicator as described in the permit or through use of a PM CEM. Additional stack tests for particulate may be required under the circumstances described in the permit.
- The three hour averaging time associated with the particulate standard for emissions units 1, 2 and 3 is applicable during compliance demonstration through performance test.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.

PAST PERMIT SUMMARY:

Permit type	Log #	Complete Date	Issuance Date	Summary of Action
V-99-066 Title V	E709	12/16/1996	3/9/2000	Initial Title V
A-98-008 Acid Rain Permit			3/5/1999	Acid Rain Permit
A-98-009 Acid Rain Permit			3/5/1999	Acid Rain Permit
V-05-002 Title V Renewal w/ Acid Rain, NOx Budget	AI 3319	04/02/05		Title V Renewal w/ Acid Rain & NOx Budget Permits